

WHAT IS CLAIMED IS:

1. A vehicle-mounted millimeter wave radar device that detects objects by sending out millimeter waves, comprising:

a millimeter wave generation means for generating millimeter waves;

an antenna means for sending out said millimeter waves;

a substrate that is provided with wiring and said millimeter wave generation means;

an enclosure that is joined to said substrate to enclose said millimeter wave generation means and the surrounding space on said substrate in cooperation with said substrate; and

a resin that covers the joint between said enclosure and said substrate at least.

2. The vehicle-mounted millimeter wave radar device according to claim 1, comprising means for preventing outflow of said resin, wherein said antenna means is provided on a surface of said substrate opposite to the surface mounting said millimeter wave generation means.

3. The vehicle-mounted millimeter wave radar device according to claim 1, wherein said space is filled with an inert gas.

4. The vehicle-mounted millimeter wave radar device

according to claim 1, wherein said enclosure includes means for moisture absorption.

5. A millimeter wave radar module equipped with at least one MMIC for millimeter waves which is mounted on a multilayer substrate,

wherein a patch antenna circuit is formed on a surface of said multilayer substrate; said MMIC are provided on the remaining surface; said multilayer substrate is housed in a case which input/output signal terminals is put through; a hollow cap for protecting said MMIC is joined to the surface on which said MMIC is provided, and said cap is covered with a moisture resistance resin.

6. The millimeter wave radar module according to claim 5, wherein a cover covers said moisture resistance resin.

7. The millimeter wave radar module according to claim 5, wherein said case is made of a conductive material; the circumference of said input/output signal terminals is made of an insulation material, and said input/output signal terminals are put through said case with said insulation material.

8. The millimeter wave radar module according to claim 5, wherein said multilayer substrate is integral with said case.

9. The millimeter wave radar module according to claim 5, wherein said MMIC is provided on said multilayer substrate, and said patch antenna circuit is formed by a separate member.

10. The millimeter wave radar module according to claim 5, wherein said multilayer substrate is not planar structure but shaped so as to contain a space, and wherein a flat cover is joined to said multilayer substrate so as to provide a hollow storage space for said MMIC.

11. The millimeter wave radar module according to claim 5, wherein said storage space for said MMIC houses a moisture absorbent.

12. The millimeter wave radar module according to claim 5, wherein said storage space for said MMIC is filled with an inert gas.

13. The millimeter wave radar module according to claim 5, wherein said multilayer substrate is made of either an inorganic material or an organic material.

14. The millimeter wave radar module according to claim 5, wherein said hollow cap and said multilayer substrate are joined by an organic material using as an adhesive.

15. The millimeter wave radar module according to claim 5, wherein said moisture resistance resin is a gelled organic resin.

16. A method for manufacturing a millimeter wave radar module that sends out radar waves generated by at least one MMIC via an antenna pattern, the method comprising the steps of:

mounting said MMIC on a substrate with wiring;
enclosing said MMIC by joining a cap containing a hollow to said substrate in such a manner as to position said MMIC in said hollow; and

covering said the joint between said cap and said substrate at least with a gel.

17. The method according to claim 16, wherein said juncture is performed in a nitrogen gas atmosphere.

18. The method according to claim 16, wherein said substrate is provided with a wall that forms an enclosure, and wherein said gel is filled into said enclosure after said juncture.